CLAIMS

1. A method of decoding audio data, encoded in multiple DIF blocks in a Digital Video (DV) frame of a DV data stream, and outputting said audio data as a PCM frame, the method comprising:

(i) fetching a single Digital Interface Frame (DIF) block from the DV data stream, the DIF block having a plurality of bytes including a first byte and a last byte;

(ii) de-shuffling the first byte in the single DIF block to determine its index (n) in the PCM frame;

(iii) repeating step (ii) on subsequent bytes of the single DIF block until the last byte in the single DIF block is processed;

(iv) writing the de-shuffled data into the PCM frame for output if the single DIF block is the last in the DV frame;

(v) repeat steps (i) to (iv) for subsequent DIF blocks in the DV frame.

2. A method as claimed in claim 1 wherein the index (n) of a particular data sample in the output PCM frame is dependent on parameters of the DV data.

3. A method as claimed in claim 2 wherein the parameters include:

track number (t);

sync block number (s); and

byte position within the DIF block (b).

4. A method as claimed in claim 3 wherein for a first DIF block of the DV frame, t, s and a DIF block counter are set to zero.

5. A method as claimed in claim 4 wherein s is incremented by 1 each time a new DIF block is received, and is reset to zero every nine DIF blocks.

6. A method as claimed in claim 5 wherein t is incremented by 1 every nine DIF blocks.

7. A method as claimed in claim 1 wherein the DV data may be encoded to one of a plurality of different video systems, such as 525/60 (2-channel or 4-channel) or 625/50 (2-channel or 4-channel).

8. A method according to claim 7 wherein each different video system is characterized by several different constants used in the encoding and decoding of data, these constants being:

System		T	K_1	K_2	B	C_1	C_2
2-ch mode	525/60	5	45	15	2	2	10
	625/50	6	54	18	2	2	10
4-ch MODE	525/60	5	45	15	3	2	10
	625/50	6	54	18	3	2	10

9. A method as claimed in claim 1 wherein the de-shuffling of data in the single DIF block is performed according to the de-shuffling equation:

$$n = f^{-1}(t_1, s_1, b_1)$$
$$= K_1 x_1 + K_2 x_2 + c$$
$$= K_1(b_1 / B) + K_2(s_1 \%3) + (m' + T \div t_1 - 2 * \lfloor s_1 / 3 \rfloor) * 3 + \lfloor s_1 / 3 \rfloor$$

$$\text{where} \begin{cases} \text{if}(t_1 - 2 * \lfloor s_1 / 3 \rfloor) < 0, \text{m}' = 1 \\ \text{elseif}(\text{t}_1 - 2 * \lfloor s_1 / 3 \rfloor) \geq 0, \text{m}' = 0 \end{cases}$$

where t_1, s_1, b_1 are the track, sync block and byte numbers respectively, included in the single DIF block, and K_1, K_2 and B are constants characterizing a particular coding scheme.

10. A decoding apparatus for decoding audio data, encoded in multiple DIF blocks in a Digital Video (DV) frame of a DV data stream, and outputting said audio data as a PCM frame, the apparatus comprising:

means for fetching a single Digital Interface Frame (DIF) block from the DV data stream, the DIF block having a plurality of bytes including a first byte and a last byte;

means for de-shuffling the first byte in the single DIF block to determine its index (n) in the PCM frame;

means for de-shuffling subsequent bytes of the single DIF block until the last byte in the single DIF block is processed; and

means for writing the de-shuffled data into the PCM frame for output if the single DIF block is the last in the DV frame.

11. The apparatus as claimed in claim 10 wherein the apparatus is a custom Digital Signal Processor (DSP).

12. A method of decoding audio data, encoded in multiple DIF blocks in a Digital Video (DV) frame of a DV data stream, and outputting said audio data as a PCM frame, the method comprising:

fetching a single Digital Interface Frame (DIF) block from the DV data stream, the DIF block having a plurality of bytes including a first byte;

de-shuffling the first byte in the single DIF block to determine its index (n) in the PCM frame;

determining indexes in the PCM frame for subsequent bytes of the single DIF block from the index determined for the first byte; and

repeating the fetching, de-shuffling, and determining steps for subsequent DIF blocks in the DV frame.

13. The method of claim 12 wherein the de-shuffling step includes determining the index (n) in the PCM frame of the first byte based on parameters of the single DIF block without using any parameters of the DIF blocks other than the single DIF block.

14. The method of claim 13 wherein the parameters of the single DIF block include:

track number (t);

sync block number (s); and

byte position within the DIF block (b).

15. The method of claim 14 wherein for a first DIF block of the DV frame, t, s and a DIF block counter are set to zero.

16. The method of claim 14 wherein s is incremented by 1 each time a new DIF block is received, and is reset to zero every nine DIF blocks.

17. The method of claim 14 wherein t is incremented by 1 every nine DIF blocks.

18. The method of claim 12 wherein the de-shuffling step is performed according to the de-shuffling equation:

$$n = f^{-1}(t_1, s_1, b_1)$$
$$= K_1 x_1 + K_2 x_2 + c$$
$$= K_1(b_1 / B) + K_2(s_1 \% 3) + (m' + T \div t_1 - 2 * \lfloor s_1 / 3 \rfloor) * 3 + \lfloor s_1 / 3 \rfloor$$
$$\text{where} \begin{cases} \text{if}(t_1 - 2 * \lfloor s_1 / 3 \rfloor) < 0, \text{m}' = 1 \\ \text{elseif}(\text{t}_1 - 2 * \lfloor s_1 / 3 \rfloor) \geq 0, \text{m}' = 0 \end{cases}$$

where t_1, s_1, b_1 are the track, sync block and byte numbers respectively, included in the single DIF block, and K_1, K_2 and B are constants characterizing a particular coding scheme.